

What is Claimed is:

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1. A system for exploring a decision space and making decisions comprising:
 - a seeker for acquiring a plurality of candidates;
 - a filter for selecting a subset of candidates from said plurality of candidates; and
 - a viewer for displaying said subset of candidates and enabling narrowing of said subset of candidates.
 2. The system of claim 1 wherein said seeker acquires said plurality of candidates by retrieving said plurality of candidates from a database.
 3. The system of claim 1 wherein said seeker acquires said plurality of candidates by generating said plurality of candidates using components from a device library.
 4. The system of claim 3 wherein said device library comprises components, component behaviors, and composition schemes.
 5. The system of claim 4 wherein said components are defined by using a functional and compositional modeling language.
 6. The system of claim 3 wherein said device library supports composition of a device without reference to a specific environment.
 7. The system of claim 3 wherein said device library supports composition of a deployed device.
 8. The system of claim 1 wherein said seeker acquires candidates using an FCML simulator.
 9. The system of claim 8 wherein said FCML simulator is adapted to answer questions about candidates.

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10. The system of claim 1 wherein said seeker uses distributed computation to evaluate a large number of candidates.
11. The system of claim 1 wherein said filter is selected from the group consisting of classical dominance filter, strict dominance filter, superstrict dominance filter, selective superstrict dominance filter, discernible difference dominance filter, two-pass tolerated filter, and onionskin filter.
12. The system of claim 1 wherein said filter uses a tolerated dominance method to select said subset of candidates.
13. The system of claim 1 wherein said viewer is adapted to use a multi-attribute display.
14. The system of claim 1 wherein said viewer is adapted to display a trade-off scatterplot of said subset of candidates.
15. The system of claim 14 wherein said viewer is adapted to display a first selected region of candidates from a first scatterplot in a first color, a second selected region of candidates in a second scatterplot in a second color, an intersection between said first selected region and said second selected region in a third color, and unselected candidates in a fourth color.
16. The system of claim 1 wherein said plurality of candidates is designs for hybrid electric vehicles.
17. The system of claim 1 wherein said plurality of candidates is selected from the group consisting of candidates for a design task, candidates for planning task, candidates for a purchasing task, and candidates for alternative hypotheses.
18. A system for exploring a decision space and making decisions comprising:

a seeker for acquiring a plurality of candidates; and

a filter for selecting a subset of candidates from said plurality of candidates.

19. The system of claim 18 further comprising a viewer for displaying said subset of candidates and enabling narrowing of said subset of candidates.
20. The system of claim 19 wherein said viewer is adapted to use a multi-attribute display.
21. The system of claim 19 wherein said viewer is adapted to display a trade-off scatterplot of said subset of candidates.
22. The system of claim 21 wherein said viewer is adapted to display a first selected region of candidates from a first scatterplot in a first color, a second selected region of candidates in a second scatterplot in a second color, an intersection between said first selected region and said second selected region in a third color, and unselected candidates in a fourth color.
23. The system of claim 18 wherein said seeker acquires said plurality of candidates by retrieving said plurality of candidates from a database.
24. The system of claim 18 wherein said seeker acquires said plurality of candidates by generating said plurality of candidates using components from a device library.
25. The system of claim 24 wherein said device library comprises components, component behaviors, and composition schemes.
26. The system of claim 25 wherein said components are defined by using a functional and compositional modeling language.
27. The system of claim 24 wherein said device library supports composition of a device without reference to a specific environment.

28. The system of claim 24 wherein said device library supports composition of a deployed device.

29. The system of claim 18 wherein said seeker acquires candidates using an FCML simulator.

30. The system of claim 29 wherein said FCML simulator is adapted to answer questions about candidates.

31. The system of claim 18 wherein said seeker uses distributed computation to evaluate a large number of candidates.

32. The system of claim 18 wherein said filter is selected from the group consisting of classical dominance filter, strict dominance filter, superstrict dominance filter, selective superstrict dominance filter, discernible difference dominance filter, two-pass toleranced filter, and onionskin filter.

33. The system of claim 18 wherein said filter uses a toleranced dominance method to select said subset of candidates.

34. The system of claim 18 wherein said plurality of candidates is designs for hybrid electric vehicles.

35. The system of claim 18 wherein said plurality of candidates is selected from the group consisting of candidates for a design task, candidates for planning task, candidates for a purchasing task, and candidates for alternative hypotheses.

36. A system for exploring a decision space and making decisions comprising:

a filter for selecting a subset of candidates from a plurality of candidates; and

a viewer for displaying said subset of candidates and enabling narrowing of said

subset of candidates.

37. The system of claim 36 further comprising a seeker for acquiring said plurality of candidates.
38. The system of claim 37 wherein said seeker acquires said plurality of candidates by retrieving said plurality of candidates from a database.
39. The system of claim 37 wherein said seeker acquires said plurality of candidates by generating said plurality of candidates using components from a device library.
40. The system of claim 39 wherein said device library comprises components, component behaviors, and composition schemes.
41. The system of claim 40 wherein said components are defined by using a functional and compositional modeling language.
42. The system of claim 39 wherein said device library supports composition of a device without reference to a specific environment.
43. The system of claim 39 wherein said device library supports composition of a deployed device.
44. The system of claim 37 wherein said seeker acquires candidates using an FCML simulator.
45. The system of claim 44 wherein said FCML simulator is adapted to answer questions about candidates.
46. The system of claim 37 wherein said seeker uses distributed computation to evaluate a large number of candidates.
47. The system of claim 36 wherein said filter is selected from the group consisting of

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classical dominance filter, strict dominance filter, superstrict dominance filter, selective superstrict dominance filter, discernible difference dominance filter, two-pass tolerated filter, and onionskin filter.

48. The system of claim 36 wherein said filter uses a tolerated dominance method to select said subset of candidates.
49. The system of claim 36 wherein said viewer is adapted to use a multi-attribute display.
50. The system of claim 36 wherein said viewer is adapted to display a trade-off scatterplot of said subset of candidates.
51. The system of claim 50 wherein said viewer is adapted to display a first selected region of candidates from a first scatterplot in a first color, a second selected region of candidates in a second scatterplot in a second color, an intersection between said first selected region and said second selected region in a third color, and unselected candidates in a fourth color.
52. The system of claim 36 wherein said plurality of candidates is designs for hybrid electric vehicles.
53. The system of claim 36 wherein said plurality of candidates is selected from the group consisting of candidates for a design task, candidates for planning task, candidates for a purchasing task, and candidates for alternative hypotheses.
54. A system for exploring a decision space and making decisions comprising:
 - a seeker for acquiring a plurality of candidates;
 - a viewer for displaying and enabling narrowing of a subset of candidates from said plurality of candidates.

55. The system of claim 54 wherein said seeker acquires said plurality of candidates by retrieving said plurality of candidates from a database.
56. The system of claim 54 wherein said seeker acquires said plurality of candidates by generating said plurality of candidates using components from a device library.
57. The system of claim 56 wherein said device library comprises components, component behaviors, and composition schemes.
58. The system of claim 57 wherein said components are defined by using a functional and compositional modeling language.
59. The system of claim 56 wherein said device library supports composition of a device without reference to a specific environment.
60. The system of claim 56 wherein said device library supports composition of a deployed device.
61. The system of claim 54 wherein said seeker acquires candidates using an FCML simulator.
62. The system of claim 61 wherein said FCML simulator is adapted to answer questions about candidates.
63. The system of claim 54 wherein said seeker uses distributed computation to evaluate a large number of candidates.
64. The system of claim 54 further comprising a filter for selecting said subset of candidates from said plurality of candidates.
65. The system of claim 64 wherein said filter is selected from the group consisting of classical dominance filter, strict dominance filter, superstrict dominance filter, selective

superstrict dominance filter, discernible difference dominance filter, two-pass tolerated filter, and onionskin filter.

66. The system of claim 64 wherein said filter uses a tolerated dominance method to select said subset of candidates.
67. The system of claim 54 wherein said viewer is adapted to use a multi-attribute display.
68. The system of claim 54 wherein said viewer is adapted to display a trade-off scatterplot of said subset of candidates.
69. The system of claim 68 wherein said viewer is adapted to display a first selected region of candidates from a first scatterplot in a first color, a second selected region of candidates in a second scatterplot in a second color, an intersection between said first selected region and said second selected region in a third color, and unselected candidates in a fourth color.
70. The system of claim 54 wherein said plurality of candidates is designs for hybrid electric vehicles.
71. The system of claim 54 wherein said plurality of candidates is selected from the group consisting of candidates for a design task, candidates for planning task, candidates for a purchasing task, and candidates for alternative hypotheses.
72. A method for exploring a decision space and making decisions including the steps of:
- acquiring a plurality of candidates with values for various attributes;
 - selecting one of a plurality of filters to locate a subset of candidates from said plurality of candidates; and
 - displaying said subset of candidates for comparison and selection of subsets for

further examination.

73. The method of claim 72 wherein the step of acquiring a plurality of candidates includes the step of retrieving said plurality of candidates from a database.
74. The method of claim 72 wherein the step of acquiring a plurality of candidates includes the step of evaluating a plurality of candidates using a seeker.
75. The method of claim 72 wherein the step of acquiring a plurality of candidates includes the step of generating a plurality of candidates using a device library.
76. The method of claim 75 wherein said device library includes components, component behaviors, and composition schemes.
77. The method of claim 72 further including the step of defining components using a functional and compositional modeling language.
78. The system of claim 75 wherein said device library supports composition of a device without reference to a specific environment.
79. The method of claim 75 wherein said device library supports composition of a deployed device.
80. The method of claim 72 wherein the step of generating candidates includes the step of generating candidates using an FCML simulator.
81. The method of claim 80 further including the steps of asking questions about said candidates and receiving answers to them from said FCML simulator.
82. The method of claim 72 wherein the step of selecting a filter includes the step of selecting a filter from the group consisting of classical dominance filter, strict dominance filter, superstrict dominance filter, selective superstrict dominance filter,

discernible difference dominance filter, two-pass filter, and onionskin filter.

83. The method of claim 72 wherein the step of selecting a filter comprises the step of selecting a filter that uses a tolerated dominance relation.

84. The method of claim 72 wherein the step of displaying said subset of candidates includes the step of displaying said candidates in a multi-attribute display.

85. The method of claim 72 wherein the step of displaying said subset of candidates includes the step of displaying a trade-off scatterplot of said subset of candidates.

86. The method of claim 72 wherein the step of displaying said subset of candidates includes the steps of:

displaying a first selected region of candidates from a first scatterplot in a first color;

displaying a second selected region of candidates in a second scatterplot in a second color;

displaying an intersection between said first selected region and said second selected region in a third color; and

displaying unselected candidates in a fourth color.

87. The method of claim 72 wherein the step of acquiring a plurality of candidates includes the step of locating a plurality of candidate designs for hybrid electric vehicles.

88. The method of claim 72 wherein the step of acquiring a plurality of candidates includes the step of selecting a plurality of candidates from the group consisting of candidates for a design task, candidates for planning task, candidates for a purchasing task, and candidates for alternative hypotheses.

89. A method in a computer system for displaying candidates for a decision problem comprising the step of:

displaying on a screen a distribution of candidates along each criteria for said decision problem.

90. The method of claim 89 further comprising the step of determining which candidates in any one of the criteria have been selected.
91. The method of claim 89 further comprising the step of performing intersections of different selections along different criteria.